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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/750,310	12/31/2003	Colin John Dickinson	M02A296	9706
20411 7590 12/21/2006 THE BOC GROUP, INC. 575 MOUNTAIN AVENUE MURRAY HILL, NJ 07974-2064			EXAMINER ZERVIGON, RUDY	
			ART UNIT	PAPER NUMBER
			1763	
SHORTENED STATUTORY PERIOD OF RESPONSE		MAIL DATE	DELIVERY MODE	
3 MONTHS		12/21/2006	PAPER	

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary

Application No.

10/750,310

Applicant(s)

DICKINSON, COLIN JOHN

Examiner

Rudy Zervigon

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 23 October 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-21 is/are pending in the application.
- 4a) Of the above claim(s) 10-21 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-9 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Election/Restrictions

1. Applicant's election of Group I, claims 1-9 in the reply filed on October 23, 2006 is acknowledged. Because applicant did not distinctly and specifically point out the supposed errors in the restriction requirement, the election has been treated as an election without traverse (MPEP § 818.03(a)).

Double Patenting

2. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

3. Claims 1-9 are rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-120 of U.S. Patent No. 6701972 B2 in view of Spencer; John E. et al. (US 4657618 A). Although the conflicting claims are not identical, they are not patentably distinct from each other because the claims of the present invention do not claim a

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controller to selectively control. Spencer teaches a control system (10; Figure 9) for gas precursor delivery.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to add Spencer's controller to the apparatus of U.S. Patent No. 6701972 B2.

Motivation to to add Spencer's controller to the apparatus of U.S. Patent No. 6701972 B2 is for coordinating precursor gas injection as taught by Spencer (column 9, line 61 – column 10, line 23).

Claim Rejections - 35 USC § 112

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. Claims 1-9 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

6. Claim 1 recites the limitation "said first precursor valve", and "said second precursor valve". There is insufficient antecedent basis for this limitation in the claim.

Claim Rejections - 35 USC § 102

7. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

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8. Claims 1-4, and 9 are rejected under 35 U.S.C. 102(e) as being clearly anticipated by Moriya, Shuji et al. (US 20040112289 A1). Moriya teaches an atomic layer deposition arrangement (Figure 1,2; [0009], [0032]) comprising: a process reactor chamber (50; Figure 1,2; [0009], [0032]) including an inlet (150; Figure 2; [0009], [0032], not numbered, Figure 1) for receiving precursor gases (10-40; Figure 1,2; [0009], [0032]) and at least one outlet (141; Figure 2; [0009], [0032]; not numbered, Figure 1) coupled through an outlet (141; Figure 2; [0009], [0032]; not numbered, Figure 1) line to an exhaust (140; Figure 2; [0009], [0032]; 60, Figure 1), a first precursor gas valve (12/22; Figure 1; 80; Figure 2) which receives a first precursor gas (10/20; Figure 1; 90; Figure 2), said first precursor gas valve (12/22; Figure 1; 80; Figure 2) coupled to said inlet (150; Figure 2; [0009], [0032], not numbered, Figure 1), a second precursor gas valve (32/42; Figure 1; 110; Figure 2) which receives a second precursor gas (30/40; Figure 1; 40; Figure 2), said second precursor gas valve (32/42; Figure 1; 110; Figure 2) coupled to said inlet (150; Figure 2; [0009], [0032], not numbered, Figure 1), a first bypass conduit (91; Figure 2; 11/21; Figure 1) coupled to said first precursor valve (12/22; Figure 1; 80; Figure 2), a second bypass conduit (121; Figure 2; 31/41; Figure 1) coupled to said second precursor valve (32/42; Figure 1; 110; Figure 2), and wherein said first bypass conduit (91; Figure 2; 11/21; Figure 1) and said second bypass conduit (121; Figure 2; 31/41; Figure 1) are isolated from the outlet (141; Figure 2; [0009], [0032]; not numbered, Figure 1) line, as claimed by claim 1

- i. An atomic layer deposition arrangement (Figure 1,2; [0009], [0032]) according to claim 1 wherein the first precursor gas valve (12/22; Figure 1; 80; Figure 2) and second precursor gas valve (32/42; Figure 1; 110; Figure 2) are each three way valves (Figure 2 embodiment), as claimed by claim 2

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- ii. An atomic layer deposition arrangement (Figure 1,2; [0009], [0032]) according to claim 1 wherein the first precursor gas valve (12/22; Figure 1; 80; Figure 2) and second precursor gas valve (32/42; Figure 1; 110; Figure 2) each include two two-way valves (Figure 1 embodiment), as claimed by claim 3
- iii. An atomic layer deposition arrangement (Figure 1,2; [0009], [0032]) according to claim 1 wherein the first bypass conduit (91; Figure 2; 11/21; Figure 1) and the second bypass conduit (121; Figure 2; 31/41; Figure 1) are isolated from each other, as claimed by claim 4
- iv. An atomic layer deposition arrangement (Figure 1,2; [0009], [0032]) according to claim 1 further comprising a valve (22/32; Figure 1,2) which receives a purge gas, said valve coupled to the inlet (150; Figure 2; [0009], [0032], not numbered, Figure 1) to the process reactor chamber (50; Figure 1,2; [0009], [0032]), as claimed by claim 9

Claim Rejections - 35 USC § 103

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

10. Claims 5-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Moriya, Shuji et al. (US 20040112289 A1) in view of Murakami; Satoshi et al. (US 5431738 A). Moriya is discussed above.

Moriya does not teach:

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- i. An atomic layer deposition arrangement (Figure 1,2; [0009], [0032]) according to claim 1 further comprising a substrate holding device located in the process chamber (50; Figure 1,2; [0009], [0032]), the substrate holding device movable in a longitudinal direction, as claimed by claim 5
- ii. An atomic layer deposition arrangement (Figure 1,2; [0009], [0032]) according to claim 1 wherein the chamber (50; Figure 1,2; [0009], [0032]) includes a sub-chamber (50; Figure 1,2; [0009], [0032]) and wherein the at least one outlet (141; Figure 2; [0009], [0032]; not numbered, Figure 1) is located in the sub-chamber (50; Figure 1,2; [0009], [0032]), as claimed by claim 6
- iii. An atomic layer deposition arrangement (Figure 1,2; [0009], [0032]) according to claim 5 wherein the substrate holding device comprises a vacuum hold down system, as claimed by claim 7
- iv. An atomic layer deposition arrangement (Figure 1,2; [0009], [0032]) according to claim 7 wherein the vacuum hold down system includes a hollow shaft connected to a plate member having at least one through hole, as claimed by claim 8

Murakami teaches a deposition apparatus (Figure 7) including:

- v. a substrate holding device (2; Figure 5-7; column 4; lines 30-50; column 5, line 51-column 6, line 35) located in the process chamber (1; Figure 7; column 4; lines 30-50), the substrate holding device (2; Figure 5-7; column 4; lines 30-50; column 5, line 51-column 6, line 35) movable in a longitudinal direction, as claimed by claim 5
- vi. the chamber (1; Figure 7; column 4; lines 30-50) includes a sub-chamber (below 6; Figure 7; column 4; lines 30-50) and wherein the at least one outlet (16; Figure 7; column

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- 4; lines 30-50) is located in the sub-chamber (below 6; Figure 7; column 4; lines 30-50), as claimed by claim 6
- vii. the substrate holding device (2; Figure 5-7; column 4; lines 30-50; column 5, line 51-column 6, line 35) comprises a vacuum hold down system (7; Figure 7), as claimed by claim 7
- viii. wherein the vacuum hold down system (7; Figure 7) includes a hollow shaft (7; Figure 7) connected to a plate member (6; Figure 7) having at least one through hole, as claimed by claim 8

It would have been obvious to one of ordinary skill in the art at the time the invention was made to add Murakami's substrate holding device to Moriya's apparatus.

Motivation to add Murakami's substrate holding device to Moriya's apparatus is for achieving the required thickness of the deposited film as taught by Moriya (column 7, lines 30-32).

Conclusion

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Examiner Rudy Zervigon whose telephone number is (571) 272-1442. The examiner can normally be reached on a Monday through Thursday schedule from 8am through 7pm. The official fax phone number for the 1763 art unit is (571) 273-8300. Any Inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Chemical and Materials Engineering art unit receptionist at (571) 272-1700. If the examiner can not be reached please contact the examiner's supervisor, Parviz Hassanzadeh, at (571) 272-1435.


12/19/6